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Gauge-Fixed Fourier Acceleration

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For an asymptotically free theory, a promising strategy for eliminating Critical Slowing Down (CSD) is naïve Fourier acceleration. This requires the introduction of gauge-fixing into the action, in order to isolate the asymptotically decoupled Fourier modes. In this talk, we present our approach and results from a gauge-fixed Fourier-accelerated hybrid Monte Carlo algorithm, using an action that softly fixes the gauge links to Landau Gauge. We compare the autocorrelation times with those of the pure hybrid Monte Carlo algorithm. We work on a small-volume lattice at weak coupling. We use fixed, equilibrated boundary links to avoid $\mathbb{Z}_3$ and other topological barriers and to anticipate applying a similar acceleration to many small cells in a large, physically-relevant lattice volume.

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